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(56) Documents Cited

GB 2123786 A

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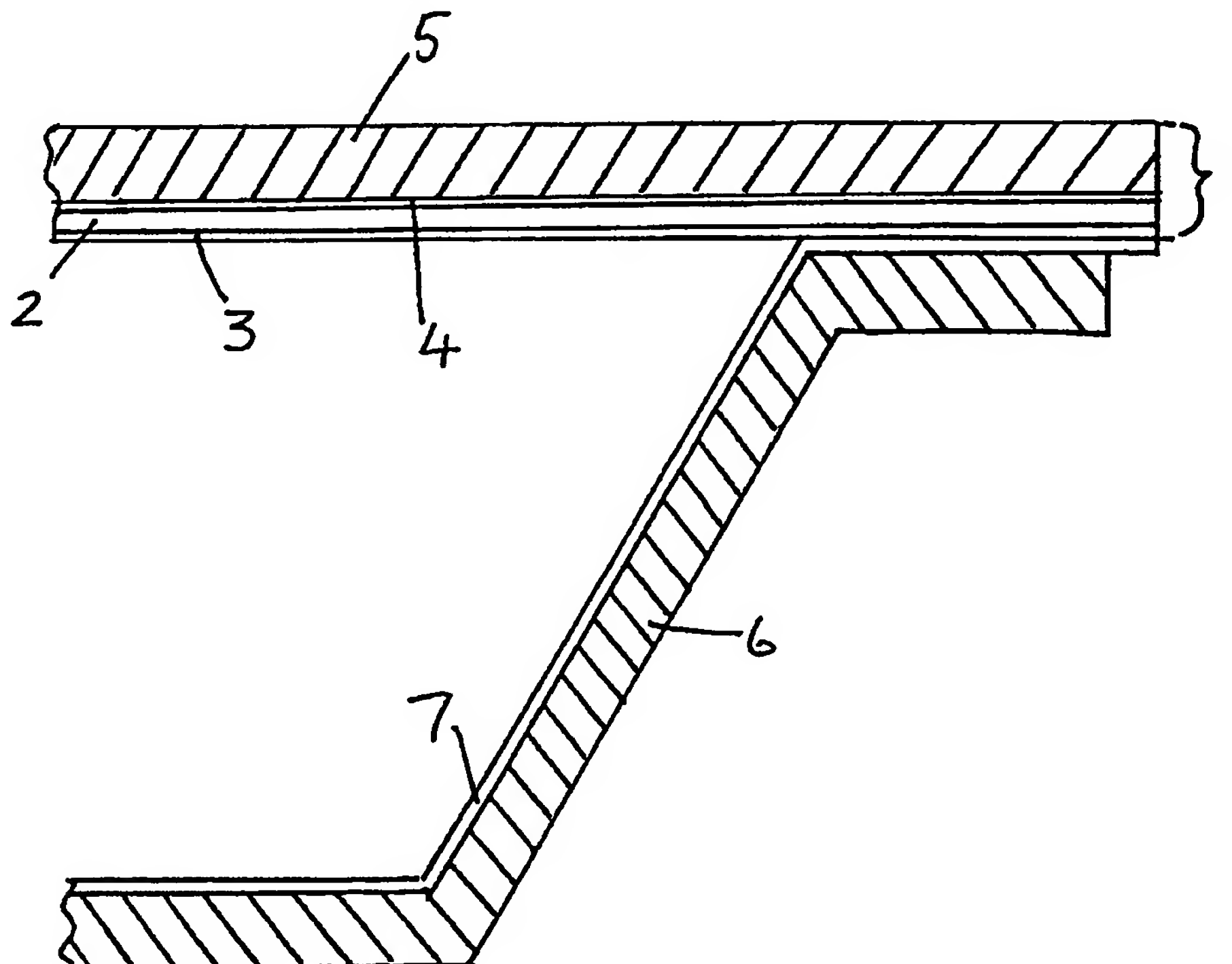
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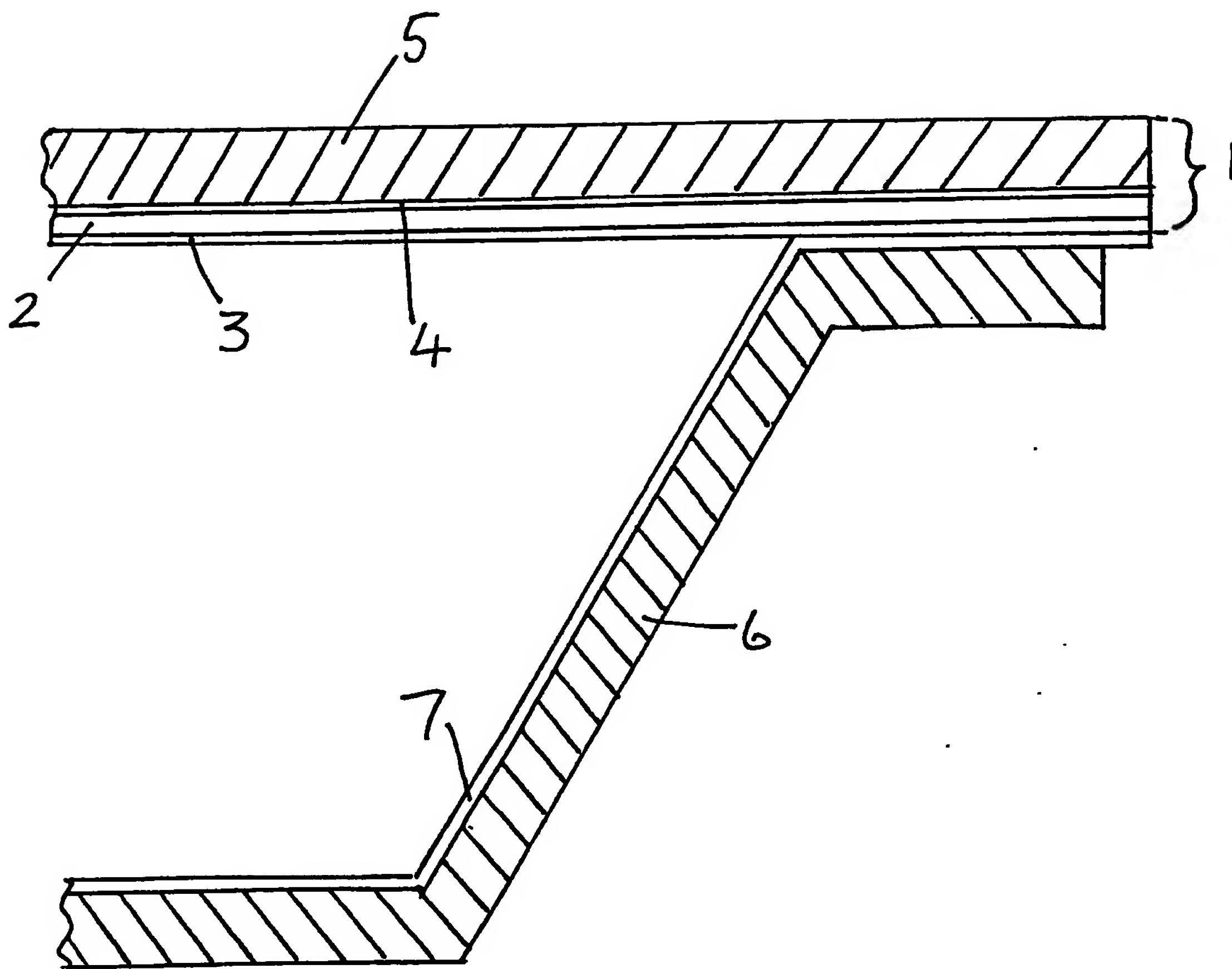
(54) A heat-sealable lid

(57) A heat-sealable lid comprises a plastics film 2, a heat-sealing layer 3 adhered to a first face of film 2 and a layer of cardboard or plastics board 5 secured with an adhesive to the second face of the film 2. The lid 1 is placed upon the opening of a plastics or plastics coated paperboard container 6 containing food, with the heat sealing layer 3 in contact with the container, and then the lid is heat sealed to the container. The film is preferably a polyester film with the heat sealing layer also a polyester of lower softening point. The heat sealing layer and film may be co-extruded or bonded together with adhesive. The adhesive bonding the board to the film may be a spirit based adhesive and the board preferably bears printed information. The food may be cooked in the container with lid package without break down of the adhesive bond.



GB 2 280 416 A

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A heat-sealable lid and its use

The present invention is concerned with sealed lidded containers of the type which are used for containing food and for cooking food therein.  
5 More particularly it is a novel lid for use in forming such sealed containers and also a method for forming the lidded containers.

Many foods are sold nowadays, usually in relatively small portions, in plastics containers sealed with flat lids secured in place by heat-sealing.  
10 The foods may be uncooked, partly cooked or fully cooked and may be of a single type in each container or in the form of complete meals for one or more persons.

15 Since foods in such containers may be required to be stored over extended periods, it is important that the seal should be and remain secure, at least until the food is to be prepared for serving,

usually by heating, for example in a conventional or microwave oven. For this reason, the lid is usually designed to be removable only with difficulty when the container and contents are in a cold condition; for example, the lid may tear or delaminate, thereby leaving evidence that the lid has been at least partly removed.

One way in which this desirable result has hitherto been achieved is to use a lid provided on at least one face with a coating of a material by which the lid can be heat-sealed to the container. For example, lids are available comprising a layer of so-called ovenable board coated on one face with low-density polyethylene (LDPE). By melting the LDPE layer in contact with the container, the lid can readily be sealed to the container. Subsequent removal of the lid at room temperature causes it to tear or delaminate but after cooking, while the container and contents are hot, the lid can be removed in one piece without difficulty.

A further important consideration in the food industry is that chemicals incorporated in plastics materials in contact with food should not migrate from the plastics material to the food, in particular during storage or heating

of the material. Statutory tests have therefore been introduced to ensure that such migration, for example of plasticiser, from a given plastics product does not occur. Unfortunately, existing  
5 tests are carried out at temperatures above the melting point of the polyethylene used for heat-sealing lids as described above, with the result that meaningful tests of this type are impossible to carry out.

10 Another approach to producing sealed containers of food is to place over the container a film of a clear or opaque plastics material laminated to a thin layer of a material by which it can be heat-sealed to the container, and then sealing  
15 the first material to the container by heating. For example, a clear film for this purpose comprising polyethylene terephthalate laminated to a softer plastics material for the heat-sealing is available from Du Pont under the registered trade mark MYLAR  
20 14 OL. However, in view of the nature of such a film, which cannot readily bear on its surface information regarding the nature of the contents of the container and the recommended cooking method, it has been necessary either to enclose the sealed  
25 container in a separate printed sleeve, or to

provide an extra lid bearing the necessary information.

It has been proposed to meet this latter need by locating above a plastics container both a plastics film of the foregoing transparent type and a separate lid and then welding the film simultaneously to the container and to the lid in a single operation. This simultaneous welding may at best be difficult to control, in particular in the food packaging industry where current practice and equipment are geared to simple heat-sealing of a single lid to a container.

It is an object of the present invention to provide an improved heat-sealable lid and a method of forming lidded containers by means of that lid.

The improved heat-sealable lid according to the invention comprises a plastics film, a heat-sealing layer adhered to a first face of the film, and a cardboard or plastics board secured with an adhesive to the second face of the film. The method according to the invention comprises placing a lid of this type upon the opening of a plastics container with the heat-sealing layer in contact with the container and heat-sealing the lid to the container.

By means of the present invention, the food-packager is able to produce a sealed lidded container by carrying out a heat-sealing operation already familiar to him, while obtaining the benefits  
5 of a container sealed with a film without the associated disadvantages of existing methods of producing film-sealed containers.

The plastics film which is an important component of the lid of the present invention may be of  
10 any material which is consistent with the intended use of the lidded container, for example for food packaging, and with the conditions to which the lid and container are likely to be subjected in use. It is preferred, particularly for food-packing  
15 uses, to use a polyester film, more preferably a film of polyethylene terephthalate. The film may be clear, translucent or opaque and may be coloured or uncoloured.

Adhered to a first face of the plastics film  
20 is a heat-sealing layer. Again the heat-sealing layer may take various forms consistent with its heat-sealing function. It may be of the same general type as that of the plastics film itself, for example a polyester of lower softening point,  
25 and may be bonded to the film with adhesive but

more preferably is formed with the film, for example by co-extrusion, during the manufacture of the film.

5 To the second face of the film the cardboard or plastics board is adhered. It is this board which will carry the printed information to be imparted to the eventual user of the package. The printing of the board may be carried out either before or after it has been adhered to the plastics  
10 film. Since the film is likely to be supplied initially in the form of a continuous roll, there are advantages in first applying the board to the film and then printing the board. However other handling considerations, for example the  
15 easier handling of the board alone as opposed to the board/film laminate, may dictate that the board be printed before the laminate is formed.

The board is adhered to the film by an adhesive. Any available adhesive which is compatible with  
20 the intended use of the lid and container may be employed for this purpose. With these considerations in mind, the adhesive should remain effective at the temperatures at which the heat-sealing of the lid to the container and any subsequent  
25 preparation of the contents of the container are



carried out. For example, a spirit-based adhesive of the desired characteristics may be used, which is preferably of a type which is suitable for use in food packaging. Among other adhesives, 5 that sold under the trade mark Witcobond 815 is effective for this purpose. Using the chosen adhesive it is possible to carry out the heat-sealing at, say,  $130^{\circ}$  to  $190^{\circ}\text{C}$  and to cook food within the container at temperatures of the order of, 10 say  $180^{\circ}$  to  $200^{\circ}\text{C}$  without break-down of the adhesive bond.

The material of the container is not of itself an important consideration from the point of view of the present invention but its nature is determined 15 by its intended use. In general, in the food industry, available containers may be of polyester, aluminium foil or paperboard, which latter material is usually coated with polyester, especially crystalline polyethylene terephthalate, to prevent inward 20 or outward migration of fluid through the paperboard.

As indicated, the heat-sealing step may typically be carried out at a temperature of the order of  $130^{\circ}$  to  $190^{\circ}\text{C}$ , depending of course upon the nature of the heat-sealing layer. The detailed carrying-out 25 of that step will be familiar to the food packager and will not differ generally, except perhaps in the choice of temperature, from what he hitherto

has done in bonding a conventional coated lid to a container.

5 The invention will now be further described and illustrated with reference to the accompanying drawing which shows, schematically and to an enlarged scale, one preferred embodiment of the lid according to the present invention, as applied to a container.

10 The illustrated lid, designated generally by the reference numeral 1, is formed upon the basis of a film 2 of polyethylene terephthalate, formed with a heat-sealing layer 3 of a second plastics material of lower softening point. The product represented by the film 2 and layer 3 together is, in the illustrated embodiment, the material provided by du Pont in roll form under  
15 the registered trade mark MYLAR 14 OL.

To the upper surface of the roll of film 2, paperboard 5, also in roll form, is bonded by means of an adhesive 4, which in the illustrated  
20 embodiment is that sold under the trade mark Witcobond 815. The resulting laminate is cut into flat sheets for printing purposes. Upon the resulting individual sheets, the information required to appear on each lid is printed, several such printings

being applied to each sheet. The sheet is subsequently cut into the corresponding number of printed lids, the resulting product being a lid 1 according to the invention.

5           The lid is illustrated after heat-sealing, along a zone close to its edge, to a paperboard tray 6 coated on its inner surface with a layer  
7   of crystalline polyethylene terephthalate. The heat-sealing step is carried out at about  
10 170°-190°C.

          The resulting lidded tray securely seals its contents until they are required to be used. The lid cannot be removed without leaving evidence of such removal or of any tampering but, when  
15 removed before or after a cooking treatment or when the contents are to be used in a cold condition, leaves the tray itself undamaged.

CLAIMS

1. A heat-sealable lid comprising a plastics film, a heat-sealing layer adhered to a first face of said film and a cardboard or plastics  
5 board secured with an adhesive to the second face of said film.
2. A heat-sealable lid as claimed in claim 1, wherein the plastics film is a polyester film.
3. A heat-sealable lid as claimed in claim  
10 2, wherein the plastics film is a film of polyethylene terephthalate.
4. A heat-sealable lid as claimed in any of claims 1-3, wherein said heat-sealing layer is of the same general type as that of said plastics  
15 film.
5. A heat-sealable lid as claimed in claim 4, wherein the plastics film is of a polyester and the heat-sealing layer is a polyester of lower softening point.
- 20 6. A heat-sealable lid as claimed in any of the preceding claims, wherein said heat-sealing layer is bonded to said film with adhesive.

7. A heat-sealable lid as claimed in any of claims 1-5, wherein said heat-sealing layer is formed with the film, during manufacture of the film.

5 8. A heat-sealable lid as claimed in claim 7, wherein the heat-sealing layer and the plastics film are formed together by co-extrusion.

9. A heat-sealable lid as claimed in any of the preceding claims, wherein said cardboard or  
10 plastics board bears printed information.

10. A heat-sealable lid as claimed in any of the preceding claims, wherein said adhesive securing said cardboard or plastics board to said film is a spirit based adhesive which is suitable for  
15 use in food packaging.

11. A heat-sealable lid substantially as hereinbefore described with reference to, and as shown in, the accompanying drawing.

12. A method of forming a lidded container  
20 comprising placing a lid as claimed in any of claims 1 to 11 upon the opening of a plastics container with said heat-sealing layer in contact with said container and heat-sealing said lid to said container.

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
**(The Search report)**

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-12-

**Relevant Technical Fields**

(i) UK Cl (Ed.M)      B8D (DCA1, DCW9, DCE)

(ii) Int Cl (Ed.5)      B65D 77/20, 81/34

Search Examiner  
LINDA HARDEN

Date of completion of Search  
10 AUGUST 1994

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-  
1-12

(ii) ON-LINE DATABASES; WPI

**Categories of documents**

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|---|---|
| <b>X:</b> Document indicating lack of novelty or of inventive step.   | <b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.        |
| <b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category. | <b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| <b>A:</b> Document indicating technological background and/or state of the art.   | <b>&amp;:</b> Member of the same patent family; corresponding document.   |

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2123786 A (S KEARNS) see in particular page 1 line 97 to page 2 line 8	1-12
X	US 4469258 (R WRIGHT) see in particular column 3 line 27 to column 4 line 15	1-12

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).